THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 49 DECEMBER 7, 1946 VOL. 58.

PAPERS PRESENTED TO CONGRESS, N.V.M.A.

No. 3—Advances in Small Animal Practice *

By

W. L. WEIPERS, M.R.C.V.S., D.V.S.M.

GLASGOW

In a paper of this kind a recital of the drugs and treatments introduced in the course of the last ten years would be of little value unless allied to a study of the trends of development in veterinary practice. Between the two wars there has been a tremendous increase in small-animal practice and with it a change of emphasis from the art to the science. It is only comparatively recently that the fundamental basic researches were sufficiently advanced to permit of medicine becoming a scientific subject. With the researches of Claude Bernard last century and the development of the experimental method by Pasteur and others the foundation of the science of therapeutics was laid. In this century bacteriologists, pharmacologists and bio-chemists have accumulated a huge body of scientific knowledge and in the larger ecological approach every aspect of a parasite's relation to its host and environment has been investigated. The earlier conception that the panacea for all ills was the discovery of an internal antiseptic lethal to the parasite but harmless to the host has been superseded by the search for and development of chemicals capable of disturbing any metabolic process of the parasite. For instance the current explanation of the action of the sulphonamides is that they appear to interfere with the general nutrition, leading to starvation and inanition. Bayer 205 appears to act by inhibiting the reproduction of certain trypanosomes, and so permits the recovery of the host.

Small-animal practice has inherited a certain number of useful empirical remedies from the pioneer veterinarians in this type of work, but by the time the large increase in small-animal practice had taken place human medicine had gone far towards developing pharmacology as an exact science, much research having been carried out to find the actions and uses of drugs and normal physiology. The old schools of medicine based on tradition, authority or therapeutic nihilism had been replaced by the practice of rational medicine based on exact knowledge. When there was a direct translation from human to veterinary medicine most of the methods had a rational basis and in some cases, having been originally based on animal experiments, the results were even more applicable to veterinary practice: but inevitably for a period some purely human aspects were accepted as having a veterinary application. As an instance the research carried out by experimental physiologists and the investigations into vitamins and endocrinology and particularly the pharmacology of the organic therapeutics that have been introduced in the last ten years all have a very distinct application to small-animal practice.

Major advances in recent years can be classified under three headings:—

Prophylactic measures;
Improved aids to diagnosis;
New therapeutics.

As knowledge increases preventive medicine assumes greater importance. Veterinary practice permits of an earlier start for prophylaxis than is available to the human practitioner. Selective breeding of vigorous healthy stock can be encouraged and scientific breeding can eliminate hereditary disease, especially when combined with intensive culling of young stock and the conduction of progeny tests. Unfortunately, at the moment, with the rapid post-war expansion of breeding stocks, less care has been taken in the selection of parent stocks, and such hereditary defects as predisposition to demodectic mange, entropion; glaucoma, luxation of the patella and spastic paralysis of Scotties are on the increase.

The Mellanbys' researches into the cause of rickets and investigations into diseases of the teeth form the basis of the science of dietetics in canine practice. When vitamin A and D concentrates are given to a bitch during pregnancy and lactation and the administration is continued in the puppies up to the age of four or five months excellent results are obtained. I know animals now over ten years old, with perfect mouths, which were reared on these lines. In some of these cases the dogs were fed on a diet of sloppy food such as was previously considered to be the main cause of pyorrhoea. Mellanby[1] has shown that when pups receive adequate quantities of vitamin D normal teeth and bones are developed and when vitamin D is deficient the condition known as dental hypoplasia develops. When vitamin A is in short supply during this period the periodontal tissues are improperly developed and the animal in later life is predisposed to periodontal disease. In adult life lack of vitamin D in dogs is not conducive to caries as it appears to be in humans. As an adult dog synthesizes vitamin C one wonders if lack of both D and C is not an essential prerequisite for the development of caries.

Prophylactic routine administration of anthelmintics early in pregnancy minimizes worm infestation in puppies and tetrachlorethylene has proved satisfactory for this purpose. Rigid control of ectoparasites is important, not only *per se* but also in the control of taeniasis.

Now to deal with the important biological prophylactics. In 1925[2] Okell, Pugh & Dalling identified the causal organism of Weil's disease with the condition known as "the Yellows" and developed satisfactorily preventive measures for what had previously been a terrible scourge in dogs with a mortality second only to distemper. It has become routine practice to carry out preventive inoculation in districts and kennels where the disease is endemic. The serum is an excellent prophylactic but of limited value as a curative unless in the early stages. In 1924 Dunkin & Laidlaw[3] started investigations into distemper, for the Distemper Research Council and after four years had carried out most of the fundamental work. This remarkable piece of research established the nature of the disease and developed satisfactory methods of prophylaxis. These workers indicated that experimental distemper was a *comparatively mild disease* with an incubation period of four days and they considered that immunization with Methods (I) or (II) gave a lifelong immunity. In practice we find the incubation period longer—five to seven days or more. In naturally occurring outbreaks distemper is *always* a serious disease with a mortality in some cases up to 80 per cent. My own records, which are necessarily incomplete, kept over a period of twelve years, indicate that most immunized dogs show slight malaise when exposed to natural infection, say, two or three months or more after injection, and 0·5 per cent. of these develop serious illness. I think this reinforcing of the artificial immunity is necessary to convert it into a lifelong immunity and for this reason prophylaxis is excellent in city dogs where exposure to natural infection is inevitable. I would like to indicate briefly what happens when distemper infection breaks out in a kennel. The old dogs are completely unaffected if they have been previously exposed to distemper—such dogs appear to be immune to every catarrhal infection with the exception of kennel cough, and manifestations of B.H.S. disease. I have never met an outbreak of infectious brown-mouth nor have I recognized an epidemic of infectious encephalitis, but I have met sporadic cases sometimes following the injection of distemper virus. The inoculated dogs in the kennel usually showed a transient fever, only an exceptional case developing severe complications. Some of the susceptible dogs have already been affected for the best part of a week before one is called in and at one time I gave these and the in-contacts serum. My results with anti-distemper serum as a curative have been disappointing and some cases given serum in the very early stages subsequently developed nervous complications. Even a small percentage of the in-contacts, which showed no rise in fever until five to seven days after the injection of serum, developed nervous complications ultimately. I know this is contrary to laboratory experience, where a pup in the second or third day of the illness caused by the injection of virulent laboratory virus can be given a large dose of serum and any untoward sequelae averted. The only conclusion I can draw is that virulent laboratory virus is a mild germ compared with naturally occurring street virus. As a preventive the serum is excellent but, unfortunately, only protects for ten days, a remarkably short period for a homologous serum. In practice one rarely meets recognizable distemper in the early stages except in a kennel and then only is serum of any real use.

* Presented to the 64th Annual Congress of the National Veterinary Medical Association of Great Britain and Ireland, at the Royal Veterinary College, London, on September 24th, 1946, Major Hamilton Kirk, M.R.C.V.S., London, in the chair.

I have not included in my figures the results of the last five years, as, during this period, the virus appeared to have been most erratic in its action and preventive measures have in some cases failed to give solid immunity and in others have caused fatal disease. American reports indicate that a virus prepared by passage through foxes gives an excellent immunity while minimizing the risk of breakdown, but there has not been any opportunity to try this strain in this country. The above divergence between laboratory and field results is quite usual and I would like to stress here that long periods must elapse before a practitioner is in a position to give a definite opinion on any prophylactic or therapeutic measure. Laidlaw & Dunkin's work indicated the method of approach to outstanding problems in veterinary practice and I consider that it was a great pity that research should have ceased on canine problems when the distemper work was completed. This work, while quite important in its application to veterinary practice, was only a small part of fundamental scientific research, and techniques elaborated there were of great value to workers investigating comparable human problems at a later date. Science is indivisible and knowledge acquired in one branch invariably advances knowledge in related subjects. The Ministry of Agriculture is naturally preoccupied with the diseases of farm animals, but I think it would be in the interests of the country generally to foster systematic investigation into the diseases of small animals, if for no other reason than that experimental methods could be explored and developed for the ultimate application to human patients. A large section of the population is now interested in the welfare of domestic pets and by the nature of our current civilization such animals contribute immeasurably to the happiness of their owners. I cannot imagine that money is necessarily better spent in investigating the diseases of food-producing animals than on animals which minister to the happiness of a large section of our population. Alternatively, I cannot think of a better way of interested parties doing something practical than to contribute money to permit of the reopening of such an institution for the investigation of current problems. There is not a practitioner in the country who would not appreciate the enormous contribution it would make to veterinary practice and science generally. It is interesting to study the writings of eminent clinicians of 20 years ago and find what we now recognize as a clinical entity carefully described as a manifestation of some other disease. Such conditions could have been readily differentiated if a small-animal research centre had been available.

I now come to one of the most important parts of my paper—diagnosis. Diagnosis is the keystone of success in clinical practice; it was once described as "coming to a conclusion on insufficient evidence." Any method that renders available new valid evidence increases the percentage of correct diagnosis. Most practices are now equipped with a small sideroom laboratory in which urine analysis and microscopic examination of skin samples, faeces and blood samples are carried out, and most have a contact with a large laboratory capable of carrying out bacteriological examination, biopsy and *post-mortem* examinations. I cannot place too much stress that such aids are only ancillary to, but are not substitutes for clinical examination, although they enhance clinical knowledge when practised over a period of years, by increasing the clinician's capacity for differential diagnosis. The tendency in the last 15 years has been towards a more exact diagnosis and I would like to indicate several groups of diseases where improved methods have permitted of more exact differentiation. New therapeutics with a marked specific action have the same effect as do also well proved biological prophylactics.

At one time the name canine typhus or Stuttgart disease included leptospirosis caused by *L. icterohaemorrhagiae* and *L. canicola*, nicotinic acid deficiency and manifestations of interstitial nephritis. In cases of leptospirosis where jaundice develops early and the disease was epidemic or endemic the probable cause was fairly obvious but in acute cases where the icteric phase did not develop or was late in appearing clinical means usually failed to reveal the cause. Microscopical examination using dark ground illumination is frequently successful in demonstrating the causal organism, but in some cases it is necessary to carry out guinea-pig inoculation. It is now known from Stuart's[4] researches into serological reactions that *L. canicola* is of fairly frequent occurrence in this country and that though during the last few years the clinical manifestations have been of a mild order, in virulent outbreaks the symptoms are those of Stuttgart disease. With routine urine examinations cases of nephritis are usually detected before the terminal uraemia develops with symptoms simulating the Stuttgart syndrome. It has been known for a long time that a deficiency of nicotinic acid (vitamin B.) will produce black tongue in dogs but it is only comparatively recently that naturally occurring cases have been reported in this country. I personally do not meet it in town practice but I know of authenticated cases occurring in shepherd's dogs where symptoms similar to Stuttgart disease developed but responded readily to the administration of nicotinic acid. The mouth lesions common to all these conditions are now considered to be a manifestation of impaired kidney function associated with nephritis but arising from different causes.

Another instance occurred when Hare & Fry[5] demonstrated that what we now recognize as B.H.S. disease was a clinical entity distinct from distemper.

The hysteria syndrome can also arise from different causes. It can be a manifestation of the distemper virus past or present: or specific hysteria, or, in some cases, can be the result of some reflex peripheral irritation. This multiplicity of origin gave rise to much confusion whereby specific hysteria was considered by many people to be an infectious disease, but nowadays the consensus of opinion is that it is caused by a toxic factor or toxic combination in the diet and prevention and cure are comparatively easy. Here is another instance where integrated research could have solved an important dietetic problem. The study of this disease in dogs known to be immune to distemper indicated its clinical individuality.

The use of X-ray is essential in small-animal practice but in the scope of this paper I cannot do more than indicate its general use. It is important for differential diagnoses in bone lesions and for the demonstration of foreign bodies, calculi, pregnancy, etc., and also in conjunction with lipiodol, barium, etc., it can be used to show non-X-ray opaque lesions, e.g., strictures, sinuses, intussusceptions, hernias, ulcers, tumours, obstructions, and so on. The injection of lipiodol intrathecally, according to the technique advised by G. R. Brook,[6] has proved of great value in detecting lesions in the spinal cord, not associated with change in the bone, which would otherwise pass unnoticed. X-ray has also contributed in differentiating abnormalities of a deep-seated bony structure like the hip joint, where certain symptoms are common to several conditions. The first mention in veterinary literature in this country of Von Perthes' disease was in 1936 when Arnold Spicer[7] reported a case in *The Veterinary Record* accompanied by an X-ray reproduction. His findings were corroborated shortly afterwards by other writers and in 1942 Formston & Knight[8] published an article suggesting that the condition was an epiphyseal displacement of the head of the femur. This hypothesis is now fairly generally accepted and new information indicates that there is a hereditary predisposition to this disease which no doubt accounts for its relative frequency in the different breeds. In the past many such cases must have been grouped with luxation of the head of the femur, fracture through the neck of the femur or fracture through the acetabulum and the necessity for routine X-ray examination becomes more obvious in differentiating such conditions.

A recital of the advances in small-animal practice would be incomplete without a brief survey of current knowledge of diseases of teeth. Pyorrhoea is the most common disease of dogs' teeth and is associated with accumulation of tartar, bad breath, loose teeth and slight disturbance in the general health—and lack of vitamin A is probably a predisposing cause. It is not associated with true toothache, only causing pain when there is mechanical displacent and the tooth assumes the role of a foreign body. When affected teeth are removed—a comparatively easy task—and tartar is dislodged from the remaining teeth, improvement occurs at once. Proliferating, alveolar periostitis fortunately is a much rarer condition and is characterized by the presence of a peculiar sour breath of a very persistent character, and frequently there is no tartar: the gums are excessively inflamed and there is often pain during mastication of food. The teeth are very difficult to extract but unless all the teeth are removed, partial relief only is obtained. It may require five or six occasions before all the teeth can be removed. When this is achieved the improvement which follows is most spectacular. The change in the dog's general health is only equalled by the entire absence of local inflammation and pain, and the gums become quite normal.

So-called dental caries of dogs is not clinically the counterpart of the human disease in the early stages but is indistinguishable from it in the end result. This condition is associated throughout with true toothache and in many cases is accompanied by dental fistula. Complete removal of the affected teeth is necessary, otherwise the fistula will recur. In the course of Mellanby's research into the cause of caries she proved that the condition known as dental hypoplasia in dogs was the result of vitamin D deficiency. Under this name she describes a condition familiar to veterinarians as distemper mouth or canker mouth and in practice usually the result of an attack of distemper in a dog under four months of age. This indicates that the distemper virus has a rachitic effect, a further manifestation of which can be seen by the marking of the teeth which occurs when distemper immunization is carried out in very young puppies.

Developing concurrently with laboratory methods has been much more scientific approach to the assessment of case history as supplied by the owner. It is no exaggeration to say that, in a large proportion of cases, there is sufficient evidence contributed by

owner to give at least a very strong clue to the diagnosis, and other factor is so useful in saving the time of a busy practitioner.

Laboratory Methods

When there is any suspicion of nephritis or diabetes urine testing ften provides the only satisfactory proof. Routine microscopical amination of skin samples permits of exact differentiation in ypical skin disease. This is an extremely important matter as the terinarian should be in a position to warn the owner of the fectious nature of the disease to other dogs—and even to himself—sarcoptic mange, and in demodectic mange of the problematical tcome of even protracted treatment. In an untreated case a gative microscopical result is important in establishing the absence demodectic mange as these parasites are readily demonstrated, t a negative result does not necessarily rule out sarcoptic mange sarcopts are much more difficult to demonstrate, though I consider the finding of an egg sufficient evidence to warrant a positive agnosis.

Woods' glass fitted to an ultra-violet lamp is particularly helpful selecting hair suspected to be infected with the ringworm rasite.

Most small-animal practitioners have a fairly complete set of instruents for endoscopy. An opthalmoscope is essential for making a orough examination of a dog's eye and its use is easily mastered. he oesophagoscope is the most useful general purpose instrument nd can be used for examining the trachea, the vagina and oesophagus. he cystoscope can only be used on bitches. The proctoscope is aluable for removing foreign bodies from the rectum and colon nd is necessary to conduct an examination of the rectal mucosa. he modern instruments have been greatly simplified, having direct ghting and a suction apparatus incorporated in the tube. I consider an oesophagoscope and the accompanying forceps to be bsolutely necessary for the removal of a badly impacted foreign dy in the lower part of the oesophagus. It is also particularly eful for demonstrating non-X-ray opaque foreign bodies and nders obvious wounds, ulcerations and burns of the oesophageal ucosa. It is the only sure method of demonstrating the annular mour so frequently present in the oesophagus of the cat.

Therapeutics

After the 1914-18 war asepsis tended to replace antiseptic surgery small-animal practice. A fuller understanding of the cause of rgical shock and methods to combat it—maintaining body temeratures and moistness in exposed tissues and minimizing trauma—ntributed greatly to surgical evolution in veterinary practice. he teaching staffs at the colleges did much at this time to diversify rgical technique, though many private practitioners made valuble contributions, and many operations and modifications were troduced and popularized.

In a review of this nature I can only enumerate such operations nd surgical procedures as are regularly practised, and this necesarily omits the most important aspect of surgery, that is, the dications for operation. A surgeon's reputation is frequently nhanced by the cases on which he does not operate. First, simple erative procedures in daily use:—

Wright's built-up plaster cast methods[9].
Irrigation of anal glands with a bulbous-pointed needle.
Sclerosing of anal glands: Auchterlonie's method.[10]
Absolute alcohol injection for prolapsed rectum.
Flank ovariotomy of cats and dogs.
Caesarean section.
Hysterectomy. Enterotomy. Cystotomy.
Gastrotomy and Uretherotomy.
End-to-end and lateral anastomosis.
Extirpation of the eyeball.
Bone suturing with light metal alloys and the use of bone pegs.

In addition to those mentioned above, I consider the following chniques of great value in small-animal practice:—

McCunn's[11] or Smythe's[12] method of treating the uterine stump in hysterectomy.
Formston's and McCunn's[13] aural re-section in selected cases of otorrhoea.
Mitchell's external canthotomy operation for blepharospasm[14], and Wright's flank method for Caesarean section[15].

Human researches into respiratory stimulation discovered the portance of carbon dioxide and its introduction into veterinary actice has done much to minimize loss of life during anaesthesia. Since the introduction of nembutal and later pentothal sodium e use of intravenous anaesthesia has greatly increased. J. G. right has done much to popularize the safe use of these drugs nd when the dose is carefully computed and administered slowly travenously the results are as good as from inhalation anaesthesia nd are preferred for their convenience, where professional assistnce is lacking. Picrotoxin has given beneficial results when toxic mptoms appear.

Nembutal appears to offer the most satisfactory means of euthanasia. A saturated solution of mag. sulph. intravenously or intracardially is also useful for this purpose.

Before proceeding to the particular application of the more recently introduced drugs in veterinary practice I would like to point out how extremely difficult it is for a practitioner to arrive at a correct assessment of the value of any therapeutic agent. It is impossible to check the results experimentally and I feel diffident about expressing an opinion on drugs which have not had an adequate trial. An eminent medical authority stated early last century that quinine should not be given in the acute stages of malaria and for 40 years people continued to die as a result of this statement, made after only a few weeks' study of the problem in India. However, I feel that any assessment of mine, in these sceptical days, is unlikely to be accepted at more than its face value and there is little danger that I may perpetuate a similar mistake.

Sulphonamides

In 1935 prontosil, the first of the sulphonamides, was introduced as a specinc for streptococcal disease and since then the wider range of drugs has been tried in related diseases and indeed in every conceivable condition. In veterinary practice they have been found particularly useful in wound infections, septic metritis, mastitis and tonsillitis. They have proved of some value in controlling the acute manifestations of B.H.S. disease and are particularly useful in some skin conditions and in certain suppurative types of otitis. They are of great value as prophylactics used in the course of surgery to combat streptococcal infection and can be applied topically, even to the peritoneum. Similar local application can be made in compound fractures. This local effect is transient and must be augmented by parenteral administration, or must be renewed locally at short intervals. In the abscess condition of cats associated with necrosis and due in most cases to cat bites, radical surgical measures combined with topical applications and supplemented by parenteral administration yields results in the type of case which previously proved most intractable. Prior to the sulphonamide treatment I frequently met cases of this nature which failed to respond to radical surgical treatment even when combined with autogenous vaccination. In the type of severe wound infection in dogs, associated with necrosis of fat, surgical treatment combined with the use of the sulphonamides gives satisfactory results. The drugs do not appear to have any controlling effect on viruses and their routine administration in distemper has been disappointing, but I wish to record an increased percentage of recovery following their early administration in the virus condition of cats described by Dalling[16] as infectious enteritis of cats. I refer to the condition which is aetiologically and immunologically comparable to distemper but clinically appears to be an acute gastritis. This apparent anti-virus effect can probably be explained by Dalling's findings that filtrates from such cases set up a benign disease, but when combined with a B.H.S. the serious fatal disease resulted. Apparently, sulphapyridine controls the streptococcus and the mild course results. While some benefit is achieved in most cases of pneumonia associated with distemper, cases occur wherein response to sulphapyridine or sulphathiazole is quite absent. Such results are contrary to what one would expect as in the past the pneumonia lesion in distemper was attributed to a streptococcus. I have also to record failure in many cases in treating the protracted diarrhoea associated with distemper by sulphaguanidine. When sulphapyridine is administered in the early stages of the fever known as pet shop disease results are fairly good. In some types of septic cellulitis in the cat's limb associated with necrosis of fibrous tissue neither sulphapyridine nor sulphathiazole appeared to confer much benefit. Sulphacetamide has given satisfactory results in septic conjunctivitis and appears to be non-irritating. As stated earlier, the sulphonamides are of value in the treatment of B.H.S. in the acute stages, but the elimination of the disease from a kennel entails the use of bacteriological measures, vaccine therapy and improvement in the general hygiene and management. The problem is rendered more difficult by the insidious onset of the disease and the widespread distribution of the B.H. streptococcus in apparently healthy subjects. A last word on the administration of sulphonamides. It must be remembered that if sulphonamide is to be of any benefit high concentrations must be achieved and maintained in the blood, that is, large doses must be frequently administered, otherwise sulphonamide-fast organisms rapidly develop.

Stilboestrol

When stilboestrol was first introduced in human medicine as a cure for prostatic cancer high hopes were entertained for its application to our patients. R. H. Smythe[17] has reported the result of extensive trials and has found it to be of value in adenomata of the peri-anal regions, enlargement of the prostate gland, mastitis and neoplasms in various parts of the body. There is no doubt that its

administration in large doses causes regression of some tumours, particularly perianal adenoma. I have used it in conjunction with surgical removal of malignant tumours from, say, the tonsil, where previous experience would lead one to believe that rapid recurrence was inevitable. The results in some cases appear to be completely successful but in most cases tumours recurred either at the original site or elsewhere. The administration of stilboestrol appears to render the body an inimicable medium for the growth of certain tumours, but when its administration is withheld the original condition appears to recur with tendency to further tumour formation. Stilboestrol supplies a very reliable method of preventing conception, following a mésalliance, if administered in large doses, 20 mgs. to 20th dog, within two to four days of mating (Smythe says as long as ten days), some practitioners give 5 mgm. daily until a show appears; then one can expect the pregnancy to cease. It has also proved of some value when administered in small doses to increase the milk supply, and in large doses is useful in terminating milk secretion associated with pseudo-pregnancy. For a period it was used extensively in the treatment of pyometra occurring in maiden bitches, but I have noted that in cases where early success was not obtained prejudicial results frequently followed surgical interference. A minor therapeutic effect of some interest to veterinary surgeons boarding male cats is its effect in minimizing the characteristic male cat odour.

Endocrines

Insulin has been used in diabetes in dogs, maintaining health for years after the onset of the disease, but the difficulty of regular administration precludes its use in most cases. Mild cases of hypothyroidism occur in dogs and substitution therapy will maintain such animals in health. Male hormone is of definite value in producing its physiological effect in stud dogs. Some benefit has been achieved in pyometra by the administration of thyroid combined with anterior pituitary hormone. Pregnant mare serum is useful for producing oestrus in bitches whose normal cycle has been disturbed.

Vitamin B_1 is extremely useful in inappetence in small toy dogs which otherwise appear to be normal. In practice one occasionally meets dogs which appear to be deficient in the vitamin B group and its administration in such cases is followed by marked general improvement and particular improvement in certain suppurative conditions. Nicotinic acid is specific for black-tongue in dogs.

Ultra-violet therapy has proved of little value in small-animal practice—in fact, with one exception the administration of vitamin D concentrates achieved more satisfactory results. When puppies are suffering from a gastro-intestinal catarrh and are deficient in vitamin D its administration appears to aggravate the bowel condition and the ultra-violet lamp can here be used to advantage.

Infra-red and radiant heat have been used for many years in dog practice. The condition in dogs variously described as muscular rheumatism, neuritis, ossifying pachy-meningitis and sometimes associated with paralysis has been found to respond to radiant heat and infra-red radiation. In the acute form radiant heat alleviates the pain but does not appear to have any marked effect on the course of the disease and in cases where paralysis supervenes infra-red appears to be of some value in the early stages. In less acute and in chronic cases, not associated with paralysis, the therapeutic effect of large doses of infra-red radiation is sometimes spectacular, and some cases which have been established for as long a period as six weeks have been known to respond to one application, although no satisfactory reason can be given for the variation in response. Infra-red radiation is particularly useful in the treatment of bruises, contusions, muscle injuries, sprains, etc. X-ray has been used therapeutically for small active tumours like epitheliomata, but it is only at the colleges that suitable sets will be available for such treatment, as most practitioners have only small output units.

Skin Conditions

Some new therapeutics have been introduced for skin diseases and offer some advantages over the old-fashioned but effective oily remedies used in sarcoptic mange. Benzyl-benzoate is a satisfactory acaricide for dogs (its use in cats is not entirely safe). It is non-oily and easily applied, but does not shorten the usual fortnight required to produce a complete recovery. Jennings[18] has reported satisfactorily on the use of tetraethylthiuram monosulphide. My experience in the use of this preparation has been extremely satisfactory. It is the only therapeutic which I have ever used and found one application completely cure a fairly widespread sarcoptic mange. Preliminary trials on demodectic mange were inconclusive—in fact, at the moment no satisfactory remedy is available for this disease. The drug was safe and effective in notoedric mange in cats, a condition which in the past had proved troublesome to treat. Taylor[19] has reported the result of preliminary trials with benzenehexachloride (Gammexane) 1 per cent. in liquid paraffin in notoedric mange in rats which suggest even better results.

D.D.T. and gammexane have given promising results in the control of ecto-parasites but in practice have been more successful when combined with some of the older parasiticides, like pyrethrum. Otodectic mange is now recognized as a frequent cause of otorrhoea and readily responds to the simpler acaricides.

Combinations of organic arsenicals and arecoline have given fairly satisfactory results in taeniasis. No paper on recent advances would be complete without some allusion to penicillin, but in this country there has been no opportunity to apply it to small-animal practice. Reports from abroad indicate that it should have quite a widespread application, having a distinct effect on the causal organisms of certain diseases. In such cases it would only be necessary to establish a diagnosis prior to its use, but in many cases a bacteriological examination will have to be made to discover if the organism is likely to fall within the range of penicillin treatment.

In conclusion, I would like to point out that, while this list of new drugs and new methods of treatment is not imposing, many new remedies are likely to be introduced in the next decade, an essential prerequisite of whose administration will be identification of the causal organism involved. I think I have indicated earlier that such advance as has taken place has been largely in the direction of improved methods of diagnosis, placing our profession in the direct line of succession for such remedies as will shortly be produced by the organic chemist. It is probably not without significance that when the fathers of our profession drew up the diploma it specified that the holder should be permitted to practise the art and the science of veterinary medicine.

References

(1) Mellanby, May. Rep. Med. Res. Council.
(2) Okell, C. C., Pugh, L. P., & Dalling, T. (1925.) *Proc. R. Soc. Med.*
(3) Dunkin, G. W., & Laidlaw, P. P. (1926.)
(4) Stuart, R. D. (1946.) *Vet. Rec.* **58**. 131.
(5) Hare, T., & Fry, R. M. (1938.) *Ibid.* **50**. 1539.
(6) Brook, G. B. (1936.) "Spine of Dog." Baillière, Tindall & Cox.
(7) Spicer, A. (1936.) *Vet. Rec.* **16**. 325.
(8) Formston, C., & Knight, G. C. (1942.) *Ibid.* **54**. 481.
(9) Wright, J. G. (1937.) *Ibid.* **49**. 2.
(10) Auchterlonie, L. (1942.) *Ibid.* **54**. 51.
(11) McCunn, J. (1932.) *Ibid.* **12**. 511.
(12) Smythe, R. H. (1931.) *Ibid.* **11**. 1018.
(13) Formston, C., & McCunn, J. (1931.) *Vet. J.* **87**. 112.
(14) Mitchell, W. M. Private Communication.
(15) Wright, J. G. (1939.) *Vet. Rec.* **51**. 1331.
(16) Dalling, T. (1934.) *Ibid.* **14**. 1137.
(17) Smythe, R. H. (1946.) *Ibid.* **58**. 75.
(18) Jennings, S. (1942.) *Ibid.* **54**. 330.
(19) Taylor, E. L. (1946.) *Ibid.* **57**. 210.

DISCUSSION

Mr. Gordon C. Knight (Royal Veterinary College), who was the first of the openers of the discussion, said:—

I have been honoured by the invitation to open, jointly with Dr. Montgomerie, the discussion on Mr. Weipers' very comprehensive paper. In addition to offering my congratulations I can say that I have been most interested in all that has been said. With advantage to everyone there could be discussion for much longer than our programme appears to allow and it is unfortunate there is this limitation on an occasion when so many practitioners are able to meet. However, the best must be made of the time available, and, as Dr. Montgomerie I understand will confine himself to the subject of canine distemper, I feel, in view of the present particular interest in this disease and those with which it may be connected or confused, you will wish as I do to hear Dr. Montgomerie as fully as he is able to deal with the matter this morning. For this reason I shall select only a few of the many points which must be presented for discussion in a paper of such scope as that given us by Mr. Weipers.

I should like to comment mainly on the surgical and X-ray aspects.

In small animals the treatment of weight-bearing fractures by splinting or plastering does not always give us first-class results and, even after taking great care in reduction and immobilization of a simple fracture under anaesthesia, one cannot always rely on good alignment being maintained. The difficulty appears to be adequate extension and unfortunately the result is often malunion to varying extents. An answer to the problem may be bone sutures as Mr. Weipers has mentioned. The internal fixation of fractures can be developed with very great advantage and, from my own experiences, I think the light alloys may in some cases already have given place to homologous or autogenous intramedullary bone pegs. Synthetic or organic materials, maintaining good rigidity or tensile strength for a certain period but finally becoming absorbed, can also be expected.

Mr. Weipers has mentioned a method of treating the uterine stump in hysterectomy. On this could it not be said that, no matter what the condition of the uterus at the time of removal, the best method is a sound and simple ligation with gut? The small tunnel of mucosa which remains exposed may be suitably disinfected or even lightly cauterized, although not every uterus removed is infected. Any other treatment, for example invagination or flapping, unnecessarily prolongs the operation and serves no useful purpose. I would go further and suggest that, should there be a residual focus of infection in the stump, it might be better to leave it exposed to the not incapable peritoneum rather than carefully to incarcerate it in a sutured stump.

In a discussion on improvements in surgical methods nylon is worth mention. This suture material for most skin wound closures appears to give no tissue reaction. At the Beaumont nylon has found such favour that now it is used almost exclusively as a suture to be removed when its purpose has been served. In this connection perhaps I may add that there is evidence of the equally good results given in large animals. Wherever possible I would recommend the use of nylon, although, until one becomes accustomed to the rather intractable nature of the thicker strands, suturing with them is a little tedious.

Mr. Weipers has told us that the sulphonamides have great prophylactic value against post-operative sepsis. With this statement I could not be in more agreement. In spite of every reasonable aseptic precaution preceding and governing a small-animal surgical operation, sepsis, to some extent, was the not unexpected result of an otherwise sound operation. To face the facts I suggest that this was true of too many of our operations in the past, but that the topical use of a sulphonamide has made anything other than first-intention healing the exception rather than the rule.

In operative veterinary surgery this use of a sulphonamide cannot be expected to act as a substitute for sterilization of instruments or any other aseptic precaution, but as something which may reasonably make the difference between success and failure when the surgeon's best has been done. In my hands the topical use of the sulphonamides has been spectacular while their other uses have not.

At this point it may not be out of place to consider what a much better chance of carrying through an operation aseptically under normal conditions has the human surgeon than the veterinary surgeon. But even to-day I think it would be unsafe to assume post-operative sepsis in man is a misfortune of the less enlightened past.

However, hurriedly to get back to the small animal, Mr. Weipers has mentioned some of the uses of X-radiation in diagnosis and I agree that the differential diagnosis of bone disorders is worth special mention. The dog particularly has been found to suffer with bone diseases, the diagnosis of which would be difficult without X-rays. Possibly, as canine X-ray diagnosis develops, some more very interesting conditions without human analogy may be revealed. But for some time the veterinary surgeon with access to even a good X-ray diagnostic apparatus may often be confronted with a film showing a unique condition and later be surprised to find a radiologist of wide experience in the human field is at a loss to name that condition with any degree of certainty. Such is the promise of the way ahead for a veterinary surgeon interested in X-radiation.

Mr. Weipers goes on to suggest strictures, sinuses, intussusception, ulcers, obstructions and pregnancy as being within the useful scope of X-ray diagnosis. I cannot entirely agree with this and would say that we must bear in mind that our patients are such that, by palpation of the abdomen, a great deal is discovered. At no stage in pregnancy would I be any happier with the revelations of a radiograph than those of abdominal palpation and other clinical signs. If there is a practical X-ray technique for showing the foetus within the first three weeks of gestation my statement must be modified accordingly. The demonstration by X-rays of an ulcer, apart from an oesophageal one, is in my experience not very practical. I would say the same of intussusception and hernia, except in the latter case if it were restricted to the diaphragm. The use of opaque media does not yet appear to have been fully developed and I am sure plenty of scope remains for clinical investigation.

Mr. Weipers has also made a short reference to the therapeutic use of X-rays. I should like to tell you that X-radiation therapy has been extended to a variety of canine malignancies, not necessarily small ones or of epithelial origin. With suitable apparatus the treatment of a tumour in the dog presents no special difficulty, purely because the patient is a dog, except perhaps that each treatment requires the patient's anaesthetization. Further, as far as it is possible to judge, some results of the X-ray treatment of tumours in man and dogs are very comparable, but in our patients they are observed very much earlier.

The X-ray therapy apparatus in the Royal Veterinary College has enabled us to make a faint scratch on the surface of this subject, but this introductory work, aimed at the cure of malignancy in the dog, I am glad to say may indirectly have benefited the human being.

On the subject of teeth my experience has evidently differed from Mr. Weipers', since I do not recall having met alveolar periostitis just as it has been described; neither have I gained much evidence of toothache in the dog. True caries, unless my interpretation is wrong, seems confined to molar teeth, often bilaterally, and usually in the Scottish terrier. Infra-orbital dental fistula is drained by extraction of the fourth upper premolar, but is the tooth carious, or is it more commonly found only to have a flake chipped from its lateral aspect?

Mr. Weipers' references to the beneficial effects of feeding vitamins A and D have every justification, but will not the biochemist tell us there may be other factors of equal importance? For example, there is the complex vitamin B, the calcium phosphorus ratio, the trace elements and the circumstances under which a dog may or may not synthesize vitamin C.

Finally, in this connection it is interesting to learn that black-tongue is evidently very rarely seen in at least some parts of Scotland. While certainly it is very uncommon, we do come across a typical case now and again and the first seen in the Royal Veterinary College this year was about three weeks ago.

In conclusion, I should like to give this opinion—that the veterinary surgeon of to-day, like the human surgeon and physician, is blessed with many advantages given over the past 20 years or so by the chemist, the physicist and others. Even greater advantages are evidently on the way and, hard as it is to keep abreast with every modern scientific development applicable to veterinary surgery, the small-animal practitioner must not feel too satisfied with anything of to-day, and, where possible, give every trial to all that science will offer in the future.

Dr. R. F. Montgomerie (Wellcome Physiological Research Laboratories, Beckenham), the second opener of the discussion, said: When *The Veterinary Record* announced the arrangements for this meeting I had to submit to a good deal of good-natured banter from some of my professional colleagues. Their congratulations on my selection as one of the openers of the discussion on Mr. Weipers' paper were accompanied by a rather exaggerated welcome into the field of small-animal practice. Very evidently they, perhaps like many of this morning's audience, were surprised that one who had no good claim to wide experience in the field of small-animal practice should have the temerity to take on this important task. I feel I must explain to you, as I did to them, that this invitation arose during certain discussions with the officers of the Association; discussions related to the supply and the use of canine distemper prophylactics. I was pressed to use this occasion to express my current views in these matters. I was reluctant to do this because distemper prophylaxis is an exceedingly complex subject which leaves much room for a variety of opinion based upon clinical and experimental experience, and, therefore, there is some risk that the discussion may be turned, from the excellent paper which Mr. Weipers has provided, to the limited subject on which I have been asked to speak. Even so, I must not diverge from my particular task, yet I trust that my doing this does not side track the open discussion.

This is not the occasion on which one should spend time on a historical review. Suffice it to say that the work of Laidlaw and Dunkin demonstrated the methods by which immunity to dog distemper might be obtained, and that Dalling gave several years of his life to the devising of methods by which these findings could be translated to wide practical application. Perhaps Professor Dalling would say that his work in this field put several years on him! He faced, and largerly overcame, several problems which would have daunted one less staunch.

The outstanding fact in this field, and one which accounts for many of the difficulties, is that no one had yet devised a method of affording a durable immunity to dog distemper which does not necessitate the use of living distemper virus. One method, as you know, is that of attempting to build a transient immunity by the injection of vaccine and then enhancing that immunity by injecting virus 14 to 21 days later. The other method is based on the injection of living virus and, at an interval thereafter, specific serum, in the expectation that the serum will prevent the development of more than a transient infection and that a durable immunity will ensue.

Up to the present, the only method of propagating this virus is by infecting a susceptible animal—a young dog or a ferret. Neither vaccine, virus nor serum can be procured in quantity without mass production of virus in one or other of these animals. The protective quality of vaccine or of serum can only be demonstrated by the use of susceptible dogs and the viability of virus by the injection of susceptible dogs or ferrets. This is the reason why the production of prophylactics is so uncertain and difficult and why accurate assessment of the quality is such a problem.

Despite the fact that large-scale production of distemper prophylactics is a project full of interesting technical features, very few

Organizations in the whole world have attempted it. One must assume that most have been deterred by the obvious difficulties. Few practitioners in this country have not felt the effects of the uncertainties in this production. The position has been greatly aggravated during the past three years by the demand rising to an unprecedented level at a time when animals suitable for production and test purposes have been exceedingly difficult to obtain. The current difficulties in obtaining food for the breeding and rearing of puppies and ferrets exaggerate the position. In fact, one seems to be in a vicious circle, for the periods of high demand tend to coincide with those of poor supply of what we may call our raw materials—susceptible puppies and ferrets. Several quite elaborate attempts to improve matters in this respect have effected little more than temporary relief. Personally, I cannot predict the return of free supply of distemper prophylactics in Great Britain. The outlook is, however, rapidly improving. I still refuse to offer a prediction. The situation is aggravated by the fact that one of the chief agents in immunization, potent virus, is a product which must be submitted to many tests before it is issued, and by the time these are completed the remainder of its "life" is short. A period of at least six weeks must be allowed for testing, from the date when the virus emulsion is filled out into phials for drying. During that period whole batches of dried virus may have to be discarded through failure to pass one of several tests. There can, then, be little forecasting of the immediate supply position.

I have been asked to deal specifically with the risks associated with distemper immunization. During recent years the technique of preparing bacterial vaccines and toxoids has so improved that the risks in immunizing with these products are very small. It may be this which has led many in the profession and very many dog owners to think distemper immunization is in the "inject and forget" category. That, of course, has never been the position and distemper immunization has always been accepted as a professional operation. I know of no process of immunization which calls for such a high degree of professional skill, and it is on that firm basis that I discuss the problem. "Directions" may be issued by manufacturers but they may only be regarded as indications of good practice. The practitioner must exercise his knowledge and skill in this as in other professional activities, if the profession intends to maintain—as I believe it must—that distemper immunization is a piece of true veterinary practice. Then, what are the exceptional risks in distemper immunization? I will take them product by product.

Vaccine. Although the nature of this product makes testing for non-viability less simple than is the case with ordinary vaccines, there is in my view practically no risk that the vaccine may contain viable virus. I believe the standard tests give full cover and I know of no instance in which the injection of vaccine has actually caused infection. There have been several reports of dogs going down with distemper within one week of vaccination, but I am confident that these cases arose through natural infection either shortly before, at the time of, or shortly after the injection was made. It is for this reason that careful clinical examination, including the taking of temperatures, must be associated with the preparation of the dog and its post-vaccination observation.

There exists with all vaccines the risk of local and general reaction; with a vaccine containing dead animal tissue local reaction is a distinct possibility because that tissue forms a good nidus for growth of bacteria accidentally introduced. Some years ago a tendency to abscess formation following distemper vaccination became quite prominent. Investigation showed that this occurred particularly when the *p*H of the vaccine moved to the acid side and buffering has materially improved the position. Even so, I am forced to accept the view that local swelling and abscess formation will remain a risk so long as we must inject dead animal tissue, a risk which can be reduced by scrupulous exercise of asepsis.

Serum. Since this is a homologous serum there is practically no risk—apart from that of inefficiency which I will deal with later—although I have heard of rare instances in which a severe anaphylactic type of reaction has occurred. We have never been able to reproduce such an effect.

Virus. I imagine that by far the greatest number of risks in immunization are associated with the injection of virus either following vaccine or prior to serum injection. I have said that the variety of tests to which virus is submitted occupy a period of at least six weeks—they are designed to ensure that the product contains an infective dose of distemper virus and no other infectious agent. Much of the "life" of the product passes during that time, but regular testing of samples of each batch after they have been kept under conditions which imitate those of distribution make it reasonably certain that virus does reach the practitioner's hands in a viable condition. The chief risks are: (1) that some other infectious agent is present, and (2) that the immunity response following vaccine has been insufficient and infection takes place, or (3) that the serum injected following the virus fails to hold up infection by that virus.

The first of these risks is one we know and can take steps to avoid, even covering the possibility that some new infectious agent may appear. Obviously, one cannot test every phial of every batch—there would then be none for issue!—and I know of instances in which I would accept that certain phials of a batch of virus did contain a bacterial contaminant. It is, in my view, a risk, but only of a low level.

The second and third risks are much the same, depending on the method of immunization. I express the view that they just cannot be avoided. Although laboratory tests have been designed and are practised to demonstrate that each batch of vaccine is a good antigen and each batch of serum is capable of holding up virus—with something to spare—there is evidently much response variation among dogs. The risk has to be appreciated and steps taken to determine its operation, case by case. Fortunately, we have a good indicator; distemper infection quite regularly causes a febrile reaction at a time when there is a very good chance of correcting the position. I am of the opinion that the practitioner is not justified in injecting distemper virus unless he is satisfied that he will have twice-daily temperature taking for a period of at least five days thereafter *or* has explained the risk to his client and had it mutually agreed that temperature taking be dispensed with and the serious risk accepted. I know this is a thoroughly unpopular dictum. I have heard myself criticized for holding this view. I have known my being held up to ridicule as ignorant of the conditions of general practice. I have only had nine years of intimate day-to-day association with the distemper problem, but I think that is enough to give me a good standing in discussing this problem. There is much that I, and others, have to learn, but this I do know, that no amount of skill and care in the preparation of distemper vaccine, and serum and virus, the products we have known during the past 18 years, will remove the risk of post-virus injection infection. It is a risk we have to face and be prepared to meet, it is just the type of factor which makes immunization a professional job of work. I know of no way of meeting that risk other than by twice daily temperature taking over a period of at least five days—where it cannot be so met let the practitioner advise his client as he considers best; he cannot leave him in ignorance of the position. I fully appreciate that this severely limits the scope of immunization, but we do not possess a prophylactic for distemper which, like some for other diseases, can be injected by nurses in an "inject and forget" fashion.

There is an important point in this connection. All my experience under laboratory conditions has convinced me that the first febrile reaction following distemper infection was characteristic in its timing. Whether vaccine had been injected previously or serum after the injection of virus, I had believed that the rise of temperature indicative of infection occurred with regularity on the evening of the third day, during the fourth day or, at the latest, on the fifth day thereafter. We accept this temperature reaction as fleeting and know the risk of missing it, but I was surprised recently to have from a colleague the opinion that, in greyhounds at least, the rise might be delayed until the seventh day. Mr. Weipers has stated quite categorically that in practice the incubation period is five to seven days. The point cries out for investigation and we will be delighted to co-operate with practitioners in studying it. I think it is most important. The essentials are that the time of infection is known, that careful twice daily temperature records are available, and that a blood sample is available where reaction is delayed beyond the fifth day. We will certainly do all we can to make susceptible ferrets available for the search for virus in these samples.

I must add a word on the protection afforded by current distemper prophylactics. None now think it possible to get 100 per cent. protection in immunizing against any disease and I doubt if the level in distemper over the years has varied much around 85 per cent. It is exceedingly difficult to get a good picture, for we do not hear of all the instances in which injections have failed to protect and we do not know what proportion of the injected dogs were already immune. What has disturbed one considerably have been reports—more frequently during the past 18 months—that serum injected before exposure to infection has failed to protect, or injected at what was obviously the first febrile reaction, has failed to cure. It has been suggested that new strains of distemper virus are about. I can only say that this possibility has been watched for many years and I know of no instance in which a strain of distemper virus antigenically different from the standard one has been isolated. I would add, for what it is worth, that in each of the most recent 27 cases from which we have had specimens (cases reported as instances of the failure of serum to hold injected virus or of failure of serum to protect) we have failed to demonstrate distemper virus by ferret inoculation. This makes me more anxious to discover the reason for these reports.

It is important, however, that I should say that my colleague, Mr. MacIntyre, has during recent months observed the presence

in this country of a disease of dogs which is new to us. It is a specific encephalitis caused by a virus which is certainly not related to the virus of distemper. Since it may be a little time before Mr. MacIntyre's observations are sufficiently advanced to permit a preliminary publication, I would describe the condition as a virus infection with an incubation period of about seven days; a low level of fluctuating febrile reaction commencing from the seventh to the tenth day after infection, soon to be followed by some malaise, occasionally by a mucoid discharge from the eyes and nose, and regularly by marked loss of condition and evidence of the involvement of the central nervous system. It has been transmitted by contact and there is suggestive evidence that some dogs may be carriers, that it may be precipitated by the injection of distemper and other prophylactics and that it can be confused with the nervous form of distemper. I regret that time does not permit my giving a more detailed description, but we are satisfied that this is a disease whose presence in the dog world has not been appreciated to the full and it appears to have spread in recent years. There are, of course, other diseases of the central nervous system of dogs, seemingly of an infectious nature, which have been confused with the nervous form of distemper. One such condition is the encephalitis first described by Perdrau and Pugh. There is, then, ample room for a diagnosis of "nervous distemper" being a mistake. I would appeal to practitioners who meet a disease of this type to let us have *post-mortem* specimens; we prefer the carcase but the head sent fresh with as little delay as possible is a good specimen. Let me illustrate the type of case (or outbreak) from which we would wish material—it occurred before the practitioner knew of our special interest:—

A practitioner received 17 sets of Method II (virus-serum). Eight of these he used in a group of Corgis, which were due for export to Canada. On July 9th (seven days after the inoculation) he was informed that three of these dogs had slight discharge from the eyes, but none had shown any rise in temperature. On July 16th he saw one: a bitch which had a temperature reaction to 102·5°. He injected 10 c.c. of distemper serum and almost immediately the bitch had a distinct fit. Fits occurred with increasing frequency during the next two days. These Corgis were embarked soon thereafter and the practitioner wrote to enquire if we had had any "breakdowns" with this batch of material. Our re-investigation did not place the material under any suspicion. At a later date we had the history that the bitch had been to a show two weeks before the practitioner gave the injections. At that show there was a stud dog which his client had attempted to purchase, which had died some time later of a disease characterized by severe nervous symptoms. After embarkation, the Corgi bitch and two other inoculated dogs died on about July 25th. Circumstances prevented any investigation of the illness in these dogs. It is known that the remaining nine sets of Method II supplied at the same time were used on animals which were very probably susceptible to distemper and that in none of these cases was there any serious post-injection reaction. I feel that, on such evidence as we have, the illness of these Corgis cannot be ascribed directly to the injection of the prophylactics. There are good grounds for suspecting that this was an outbreak of encephalitis, the injected bitch having been infected through direct or indirect contact with the stud dog at the show; the disease passing to other members of the group. We cannot, of course, say if the injection of the prophylactics did stimulate an intercurrent infection. Would the average practitioner contend that the illness of the Corgis was due to distemper infection associated with immunization despite the fact that, in my view, the clinical appearances were not those of that disease? This is the type of case we are most anxious to investigate, but this can only be done if we have good *ante-mortem* (if possible) and *post-mortem* specimens.

I have taken more than my share of the time of this meeting, yet it has been impossible to cover my instructions fully. I would conclude by expressing my belief that it may be some time before distemper prophylactics are again in free supply, that so long as the injection of living virus remains a necessity in distemper immunization so long will the associated risks remain and have to be accepted by the practitioner and his clients. I am satisfied that the risks can be reduced to a reasonable level, but only by good careful technique and by having the stage properly set. I believe we do get a high level of immunity in the vast majority of inoculated dogs, but appreciate that there are diseases of dogs, unrelated to distemper infection, which can well be confused with this classical clinical condition.

Mr. G. M. G. Oliver (Lanchester) said that knowing Mr. Weipers personally and having taken a great interest in all his work he was interested to hear his paper. As a country practitioner who dealt with dogs and cats in the daily round there was one question he would like to ask Mr. Weipers. He had had a lot of cats going to shows and returning with this peculiar enteritis. He had quite a few deaths until he started using soluseptasine. As Mr. Weipers said, penicillin was not freely on the market; from the amount which he was able to obtain he found there was no advantage in it but it cleared up a lagging stage of complete recovery in these cases. The owners of the cats pestered him to write something in *The Cat World* but he was not an authority on cats and would like Mr. Weipers to help to clear up this condition because his clients thought he had done wonders and were sending their friends and he was at a loss to satisfy their needs. Whether the soluseptasine was a "hit and miss" he did not know.

Another point of interest he would like to mention was that he had a dog brought to him completely comatose, in a condition of whimpering which had been going on for 12 hours and he did not know what to do. Normally he would have given it some HCN. or mag. sulph., but he felt sorry for the owner, a messenger boy, and gave the dog 2 grains of luminal plus 20 c.c. of soluseptasine every eight hours for 48 hours and the dog made a complete recovery. He would like to ask Mr. Weipers how it did so.

Mr. G. S. Allen (Honiton) said that there were one or two little points which he hoped would interest the meeting and which he would like to put to Mr. Weipers. At home he had a very valuable pup of ten months old which from the day it was weaned had never exhibited any normal appetite. It had to be practically forcibly fed. Mr. Allen had been unable to find the cause of this loss of appetite unless it was purely psychological. He had tried starvation but the puppy still took no interest in food although it lost weight rapidly. It was put back on his forced diet and did extraordinarily well on it. He wondered whether it was avitaminosis and whether Mr. Weipers could give any new information on the subject. Mr. Weipers did not mention the danger of using benzoate emulsion on the smaller and younger animals; he had found that which might set in. He had seen one puppy completely paralysed after one or two small treatments but it recovered on cessation of the treatment.

There was just one other thing about the B.H.S. about which there was so much argument in the dog world. Half the people said that it was a specific disease, others said that it was nothing of the sort and he thought the profession should do as much as it could to clear this up because one heard all sorts of opinions expressed about the disease and people who knew nothing about it wrote long articles on it, and he found himself in a position of uncertainty whether it was a specific disease which could be treated as such, or whether one must regard it as a secondary infection, or even as a symbiote which lived in many dogs without causing any disease at all. He had sent specimens of dead jaundiced puppies to the laboratories which diagnosed B.H.S. infection which merely served to confuse the ideas which he already had on the subject.

Miss Olga Uvarov (Ewell) thought that it was a great pity there was so little time in which to discuss the paper. She thanked Dr. Montgomerie for his explanation of distemper prophylaxis because this was a matter with which one encountered difficulties, and she was glad to hear the suggestion of temperature taking after distemper virus for five days. Clients grumbled at times because they were requested to take temperatures for three weeks. They took the temperatures after vaccine had been administered once a day, and after virus had been administered twice a day, and if there were failures there was a good chance of stopping it.

With regard to giving definite opinions, she thought the time had passed when one could give anything definite on catarrhal conditions. In the majority of cases one found oneself giving a lengthy dissertation that it could be a distemper or it could be B.H.S. or a mixture of the two, but it did help when one pointed out the conditions which had to be dealt with.

She was also glad that Mr. Weipers made such a strong point of laboratory diagnosis; particularly was it gratifying to hear that most practitioners did use laboratory aids nowadays. However competent one might be, the majority of diagnoses had to be made in the surgery, one had the advantage of knowing the case history and the analytical findings. She would like to ask if Mr. Weipers had had any experience of urinary analyses in skin diseases. In some cases of diabetes she had found ulcers in the dogs' feet. To begin with there were no clinical symptoms but if one asked for more details it was found that the health of the animal had declined during the last few weeks, and there was inevitably some form of dysfunction. In nine of these cases she had found hyperglycaemia which was presumably of diabetic origin.

Professor G. H. Wooldridge thought he should add his quota of thanks to the speakers but he would hesitate to discuss their papers because of their length. There were, however, one or two points on which he should like some information. In the earlier part of Mr. Weipers's paper he suggested that follicular mange might be regarded as a hereditary disease and the speaker would like to know on what evidence he based that assumption. He knew of numerous instances in which pups in early life developed follicular mange and it had been suggested that it had been transmitted

from the mother, but a much more likely explanation was that it was a post-natal infection occurring very early in life from the dam which might be a carrier of the parasite and exhibited physical symptoms. In his view the way in which infection might take place was not so much by external contact but by one of two other possible ways. One was by oral infection from the mammary glands and teats of the gland where the Demodex might be present, or secondly there might be vectors present such as lice or fleas and these might be a very important factor in the transmission of follicular mange. There were other instances of various parasites which were transmitted by vectors and which had a migratory life-history and it might apply equally well in the case of follicular mange.

Referring to Dr. Montgomerie's explanation of the situation with regard to distemper, he was in agreement with him on almost every point, but he thought Dr. Montgomerie had over-emphasized a fact which the speaker thought perhaps could be disregarded a little, that of temperature-taking between the time of inoculation and the fourth or fifth day. If it were true that the minimum period of incubation was put down as four days, with a very exceptional three and a-half days, it seemed to be quite unnecessary to take the temperature during those days. What he would prefer to do was to take the temperature at least 24 hours before inoculation, then at the time of inoculation. In the development of distemper there was at the fourth or fifth day, where there had been virulent virus inoculation, a rise of temperature which was followed the day after by a fall which might last for 24 hours or a little more, and if the temperature was taken at the time of injection only there was nothing to show that the animal might be already infected. If it was taken the day before as well as at the time of proposed vaccination it would be found out, and the danger of inoculating an animal during the incubating stage was reduced. It could not be said to have been altogether avoided because there might have been infection several days before. Even with a big dose of virus the injection of a potent serum 24 or 48 hours afterwards very definitely overtook the virus and prevented any worse development of distemper, and even although injection might have taken place 36 hours previously and there was no temperature there was a very good prospect of a serum checking its progress. This did not apply in the case of the vaccine virus process. There the practitioner was up against greater difficulties such as abscess formation at the seat of vaccination and although he knew it had been strongly recommended by Dalling and others as being the method of choice, he personally preferred to use the serum virus method. The local reaction might be due to some defect in technique but it was not always so. He was quite convinced that in some instances it was a direct response on the part of the individual dog to the introduction of a foreign protein substance under the skin. In two instances in which that occurred he was afraid that there had been faulty technique. He got the dog brought back again, great care was taken with sterilization and technique, and in each case the dog reacted in the same way again. An abscess formed and bacteriological examination failed to discover any type of organism. So that in some cases of local reaction it was no one's fault at all other than the simple susceptibility of the individual to the protein injection under the skin.

Mr. Alexander Thomson (Glasgow) also wished to register a protest that the time available to discuss two most important papers was so limited. Two points had arisen, one on the question of the increase of follicular mange. One had seen very many more cases in the last few years than before. That might be due to the routine examination of skin scrapings. Apart from the mange which was found most frequently he could not see that there was anything to support Mr. Weipers's contention of hereditary disease. He remembered an Airedale which whelped in the laboratory kennels which was suffering from follicular mange and within a week the 13 pups were suffering from the disease and one assumed that the infection or infestation had been by direct contact, but in view of the recent abstracts in the *Record* on the question of blood infiltration of these parasites that might not be correct. It was a field of research which was wide open.

He would issue one warning on the question of treatment of fracture by mechanical means applied to the bones. In human practice the use of mechanical contrivances had been on the increase for the last ten or 15 years and the tendency of more enlightened surgeons nowadays was towards discarding these appliances, particularly those fixed to the bone structure. In the small animal the mechanical splint had a very limited use, especially screws which were much too large, the structure damage was too deep and they soon slackened off.

One could discuss anaesthesia and one point of great importance to the small-animal practitioner who was practising single-handed or with inexperienced help was that anaesthesia was a specialist art. They all met on many occasions the ruptured diaphragm and here was a problem of anaesthesia which was a great anxiety to most veterinary surgeons. Mr. Weipers had had failures, he had had several failures, and always one wondered what was going on. He recently had an opportunity of testing out anaesthesia on a ruptured diaphragm with the help of a human anaesthetist and there was no doubt that in the hands of an experienced anaesthetist treatment was easy and it also made all the difference to the possibilities.

Mr. W. L. Weipers (replying to the discussion): When I was asked to give a paper my first reaction was to refuse, because for me public speaking is an ordeal of the first degree.

In spite of my reluctance I did want to give expression to views commonly held by our clinical members—possibly the most knowledgeable, but certainly the least vocal section of the profession.

I had three main objects in my paper—

(1) To take stock of the present state of our knowledge.

(2) To make readily available a catalogue of articles published on small-animals, in our periodicals, which I consider of importance to practitioners. Past volumes of *The Veterinary Record* teem with interest but a dozen volumes take up quite a large number of cubic feet. At the end of my paper I give a list of references—necessarily incomplete—but which should be of some value to those entering small-animal practice and also for the busy practitioner.

I have tried to avoid debatable topics and recent remedies and treatments, many of which are giving excellent promise but are not yet proved. The stop press is probably the most interesting part of a daily paper but its contents would not be news a week after publication.

(3) To stress the need for fundamental research into small-animal disease. There exists in small-animal practice, with the possible exception of a research centre, the entire set up which a far-seeing research worker would have attempted to establish and organize for thorough investigation of disease. Research has been and is a current fashion and to most people suggests laboratories, glassware test-tubes and herds of guinea-pigs and mice languishing in a centrally heated atmosphere.

It should not be a fragile plant that lives and grows aloft in laboratory temperatures but a sturdy growth of the field. The ecological approach to research is the only correct one and this requires the complete co-operation of research workers and clinicians.

I am sure there would be no lack of co-operation from the clinical side and the ultimate results would transcend the boundaries of our own profession and have a direct bearing on human medicine.

Dr. Montgomerie's paper was, as he himself said, an independent contribution and as such was extremely valuable. The divergence in views mentioned by Dr. Montgomerie—for instance, the incubation period of distemper—could most readily be solved by co-operation between practitioner and researcher. Such co-operation will, I feel sure, be forthcoming with a view to re-establishing distemper inoculation.

I was very interested to hear what Mr. Knight had to say with regard to X-ray therapy but he confirms my views that such therapy will only be possible with large output sets, the ordinary diagnostic set being useless for this purpose.

Mr. Knight has obviously had the same trouble which I mentioned with certain fractures failing to heal. I have used with success a phosphor-bronze alloy in the form known as Vienna silk—a stranded product which can be tied in knots without any danger of breaking—unlike silver.

Sir William MacEwan, the famous Glasgow surgeon, used bone plugs many years ago with complete success and, following his technique, I have demonstrated its practicability on the dead subject and, in fact, intended developing it but was reluctant to abandon the fairly good results I had had from the use of Vienna silk, and I still use this method.

Mr. Knight is attached to nylon but I have now almost ceased to use it and silkworm gut. I use catgut for my skin sutures and such operation cases as go home immediately after the operation have not to be seen again—a matter of some moment in these busy days. I know that theoretically it is not the best method but in practice it is successful. I use from 00 to No. 3 chromic gut prepared by Mitchell's method. I agree that the uterine stump can in many cases be treated by simple ligature but my percentage of recoveries increased when I adopted a modification of McCunn's method of invagination on very fleshy stumps. Now I treat each stump on its merits. Like Mr. Knight, I have a healthy respect for the peritoneum. It is certainly God's gift to the surgeon. I would miss the use of X-ray in differentiating a pseudo-pregnancy from a pregnancy in a fat bitch. It translates speculation into fact. Barium is particularly useful in stricture or tumour in the colon, also in diagnosing a diaphragmatic hernia and in diagonising a traumatic hernia associated with extensive bruising. I am exceedingly interested in Mr. Knight's X-ray therapy. I think such work will have repercussions on human medicine.

Mr. Oliver's first case in kittens was probably infectious enteritis.

As I stated in my paper, this condition responds to sulphapyridine, probably by controlling the associated streptococcus, and penicillin would probably have a similar, if more marked effect. With the facts available, I feel it is impossible to give an opinion in the second case.

In the case described by Mr. Allen, it is quite possible the puppy's lack of interest in food was due to a conditioned reflex. I have occasionally found such cases which cannot be explained in any other way. I think it would be worth trying an administration of vitamin B. This frequently improves the appetite when inappetence does not arise from some pathological condition. I realize that benzyl-benzoate is dangerous in small animals and I have found that if puppies are treated together with any skin dressing they invariably lick each other. He asks if B.H.S. is a specific disease. I think there is now no doubt that it is so. It was described many years ago by Henry Gray as part of the distemper syndrome, later Smythe described a manifestation of the condition as pneumo-enteritis and Hare & Fry recorded the condition occurring as an endemic in kennels associated with beta haemolytic streps. Since then the disease has grown mightily and in many cases it is extremely difficult to differentiate between pure B.H.S. disease and virus infection associated with B.H.S.

I agree with Miss Uvarov that the differential diagnosis in distemper is extremely difficult, unless in a kennel. I also agree about the long dissertation on distemper with one's clients and deplore its necessity. I had not met cases of transient glycosuria associated with gangrenous areas in the skin. I have seen this condition reported by some of the Central members and have been on the lookout for it. I have no doubt that we will ultimately import this condition from England. Most diseases appear to start in the south and travel north.

With regard to the point raised by Professor Wooldridge concerning the hereditary nature of demodectic mange, I particularly stress in my paper that the *tendency* appears to be inherited. I do not think anyone doubts that the condition is more prevalent in certain breeds; for example, Manchester terrier and dachshund. I think the gene for short hair is probably associated with such predisposition, although the predisposition can exist independently. Where a variety of puppies are reared together they may all develop demodectic but the puppies that have been affected as a result of contact do not usually develop the intractable form of the disease. I have kept long- and short-haired dachshunds together and have never seen demodectic mange in long-haired dachshunds, although I frequently get it in short haired. I frequently get a mild form of squamous demodectic in all breeds of dogs, which readily responds to treatment or improves without treatment.

I concede the importance of taking the temperature 24 hours before injection, with the object of catching a preliminary rise.

Mr. Thomson raised the matter of heredity in demodectic mange. I have dealt with this matter in my reply to Professor Wooldridge.

I am very sorry to have had to shorten my reply and feel I have not adequately dealt with all the interesting points raised by previous speakers but, as we are now one hour behind schedule, I have no alternative.

The Chairman (Major Hamilton Kirk) thanked Mr. Weipers for his paper and the two openers for their very valuable contributions to the discussion.

INVESTIGATION OF HILL SHEEP FARMING PROBLEMS

In the course of his recent address to the National Sheep Breeders' Association at York, Mr. Tom Williams, the Minister of Agriculture, announced that the Agricultural Improvement Councils of England and Wales and for Scotland and the Agricultural Research Council had decided that the investigation of hill sheep farming problems does not call for the establishment of a Hill Sheep Farming Research Institute. It is considered there should be stations of the experimental husbandry type for extending and testing research results applicable to hill sheep farming and for providing facilities for research workers to study problems bearing on such farming.

* * * * *

After making arrangements to export a famous Aberdeen-Angus bull, a Scottish breeder received instructions from the Ministry of Agriculture to fix a registration plate on the beast's ear. After doing this, the breeder received a telephone call from a Ministry official saying that the order had been countermanded, the plate must be removed and the registration number branded on the animal's horns. The breeder's feelings can be better imagined than described when it is mentioned that the famous breed is hornless. —*News Chronicle*.

CLINICAL COMMUNICATION

An Investigation into Entero-Toxaemia in Goats

W. B. QUARMBY, M.R.C.V.S.
Beverley, East Yorks.

The herd in which this infection occurred consisted of 12 adult goats, two goatlings, two kids and two billies.

The pasture on which the goats strayed was a ley consisting of rye grass, coltsfoot, timothy and red and white clover, no goats having been on any of the pastures for three years previously. It had been limed and basic slag applied, at the rate of 15 cwt. to the acre.

The goat houses were modern and well kept and feeding was satisfactory, the owner being a recognized authority on goat management. No bad reports have been received of goats sold from the herd.

In June, 1944, the owner noticed that his goats were rapidly losing bodily condition and their milk yields were far below what was expected of them.

Eventually one of the goats died and I carried out a *post-mortem* examination. There were no lesions beyond anaemia and emaciation and the alimentary tract was sent for examination to Leeds University. The laboratory report indicated a high worm count and advised immediate anthelmintic treatment.

Forthwith the goats were moved from the pasture and treated with phenothiazine and copper sulphate on alternate weeks for one month. This was repeated when the goats were brought in for the winter. Although a kid died there seemed to be some improvement in the general condition of the remainder, but their weights remained far below normal.

The animals got through the winter without further deaths, but by spring two goats were so weak they could not be put out with the rest. One died shortly afterwards to be followed a fortnight later by the other, the carcase of the latter being sent intact to the Ministry's Laboratory at Weybridge—June 5th, 1945.

Symptoms.—All the goats showed similar symptoms but in varying degrees. Out of these, four goats died, five became obviously ill and the rest showed arrested growth and poor milk yield. Generally the appetite was maintained.

At first, a drop in milk yield was noted, to be succeeded by a remarkable anaemia of the horn buds and gums; then followed an intermittent diarrhoea. Symptoms progressed towards paralysis of the hind limbs which later involved the fore limbs, until the goat was unable to move—one goat lay for over a week, stretched out on its side, motionless, and had to be supported to be fed. A few days before death nervous spasms of the neck and masseter muscles were apparent. Death was never sudden but was always preceded by anaemia and progressive emaciation.

Post-mortem Examination.—Four goats were examined. From each carcase emanated a most penetrating odour, which is distinctive of the condition. The musculature was pale and waterlogged.

Abdominal Cavity.—In three cases three pints of greyish fluid were present. The kidneys were in a state of degeneration compatible with the state of the carcase, but never pulpy. In two out of three cases there was a greyish deposit around the attachment of the mesentery to the alimentary tract. In the other case where the deposit was not present at the mesentery-alimentary junction, it was found covering the outside and inside of the pericardial sac.

The heart muscle in the last three cases was very pale with a large number of petechiae. The pericardial sac contained superabundant grey fluid.

The spleen and liver were hyperaemic.

Unfortunately, whenever the digestive tract was sent alone for laboratory examination it always arrived in a condition unsuitable for accurate diagnosis.

Diagnosis.—The Ministry's Laboratory at Weybridge examined the intact carcase of a goat and were able to demonstrate the presence of *Cl. welchii*, Type D, in the intestine. The worm count showed worms in insignificant numbers. They advised immediate use of *Cl. ovitoxicus* serum.

No doubt the worms that were present in the early case had been eliminated in the rest of the goats by the routine dosing, though I believe their presence had complicated matters in the first instance.

A sample of blood showed: magnesium, 2·69 mgm. per 100 c.c.; calcium, 10·4 mgm. per 100 c.c.; both figures being quite within the normal range.

Treatment.—There were three goats ill when the Ministry returned their diagnosis and each was given 20 c.c. of serum: the rest of the adults were given 10 c.c. and the kids 5 c.c.—June 25th, 1945. The dose of 20 c.c. was repeated in four days' time; the unaffected goats were not inoculated again until four weeks later.

The first injection was always followed by malaise for about two days, but the second dose appeared to have no such effect.

A stud billy-goat was seen to be starting with anaemia; it was at once inoculated. The result was apparent in two days and within a week he was looking fit and well.

In the females the response was not so rapid but in all cases improvement was noticeable.

[Careful graphs compiled for each case indicated the occurrence of a rapid rise in milk secretion following the injection of serum. A gradual increase in weight was also to be observed.]

Discussion

Although the use of *Cl. ovitoxicus* serum proved useful in this condition, recovery was certainly not startling except in the case of the stud billy-goat. Prophylactic treatment cannot be considered fool-proof because in spite of inoculations one kid became obviously ill and died; one other did not mature as well as the rest.

The billy-goat received 35 c.c. at each dose, with a four-day interval. In spite of prophylactic inoculations and curative treatment one kid died, but this is the only case which has been lost since commencing to use *Cl. ovitoxicus* serum.

In future, kids will be inoculated within a few days of birth and re-inoculated in a month. Routine wash dosing will be started as early as possible.

The goats which have been ill still have dull coats and are not as fat as they ought to be; otherwise their appearance and behaviour are normal.

The infection tends to be of a low grade or chronic type and once it has become established is extremely difficult to eradicate from a herd. By treating the youngsters at an early date it is hoped that prophylaxis may prove completely effective.

It may be that the variable symptoms are due to different strains of *Cl. welchii* or that conditions in the alimentary tract influence the degree of acuteness of the attack, but whatever the explanation may be it is certain that the presence of parasites is a disturbing or even predisposing factor. Management and control of parasites, therefore, must not be overlooked when measures are introduced to counter an attack.

Addendum to Discussion

Thompson & Ross[1] isolated *Cl. welchii* Type D from the intestine of a goat which had died within 21 hours of the onset of symptoms.

The *post-mortem* signs revealed that both kidneys were swollen and pulpy and that there were patches of congestion throughout the small intestine, the duodenal part being filled with a blood-stained material; the heart showed sub-endocardial haemorrhages. Six goats had died in this outbreak, death occurring after an illness of between nine hours and eleven days. Treatment with 5 c.c. of pulpy kidney serum produced an immediate response.

Barron[2] reports an outbreak of entero-toxaemia in goats in which death was equally rapid. He also reports patchy inflammation of the bowel, pulpiness of the kidneys and haemorrhages in the heart muscles.

The similarity of symptoms in more chronic cases between the condition under review and those of parasitic gastritis is striking.

Marsh & Tunnicliffe[3] mention an outbreak of entero-toxaemia in lambs occurring simultaneously with coccidiosis and conclude that coccidiosis creates suitable intestinal conditions for the growth of *Cl. welchii*.

Robertson[4] shows that fat and healthy lambs can harbour a large number of worms without showing any ill effects. He states that "a lamb can bear an infestation of over 30,000 worms without investigators reporting signs of worm infestation."

Acknowledgments.—I am indebted to the staff of the Ministry's Laboratory of Weybridge for their interest and help offered in carrying out pathological and bacteriological examinations. Also to the Veterinary Department of Leeds University for doing the worm count, and to the Physiology Department of the Edinburgh Veterinary College for their report on the blood sample.

References

(1) Thompson, A., & Ross, Helen E. (1943.) *Vet. Rec.* 55. 127.
(2) Barron, N. S. (1942.) *Ibid.* 54. 82.
(3) Marsh, H. O., & Tunnicliffe, E. A. *J. Amer. vet. med. Ass.* 104. 13.
(4) Robertson, D. (1940.) *Vet. Rec.* 52. 553-555.

Weekly Wisdom

The German universities were not able to act as an effective barrier against the tides which swept over the nation. But can we claim for the universities of the West that they are alive to what are the vital forces of our time, or give any guidance to the public mind, or even to the student mind, in wisdom and balanced judgment?—Christian News-Letter.

ABSTRACTS

[I.—Hormonal Methods of Pregnancy Diagnosis in Mares on Stud Farms. (Trans. title.) Zavadovskii, B. M., & Nesmejanova-Zavadovskaja, E. (1945.) *Dokl. Akad. seijskohoz. Nauk.* No. 7/8. 3-8. **II.—Importance of Vitamin Content in Fodder for the Reproductive Function and the Content of Pregnancy Hormones in the Blood of Horses.** Zavadovskii, B. M., & Nesmejanova-Zavadovskaja, E. (1945.) *C. R. (Dokl). Acad. Sci., U.R.S.S.* N.S. **46**. 337-339.]

Pregnancy diagnosis was carried out in two stud farms by rectal examination and by biological tests for blood gonadotrophins, the hormonal tests being made between the 42nd and 90th day after service, using mice and chickens as test animals.

In stud farm No. 33, 54 mares were examined and tested. There were two incorrect results with the blood test, these being false positive results.

In the second stud farm (No. 40) much less accurate resuts were obtained Forty-eight mares were examined; in only 25 cases (20 pregnant and five non-pregnant) were the hormonal tests in agreement with the diagnosis made on rectal examination. The diagnosis in these 25 cases was confirmed at foaling. Excluding all doubtful results, there were 12 cases where the hormone tests were proved wrong by the results at foaling time, there being four false positive tests and eight false negatives. In addition to these 12 mares, three mares which were diagnosed as non-pregnant on the basis of the hormone tests but as pregnant by rectal examination, proved to be non-pregnant.

From a study of the times of rectal examinations and blood tests, the authors demonstrate that the errors in the tests were due to (*a*) early abortion or resorption of the foetus, the gonadotrophin persisting in the blood for some time after the loss of the foetus; and to (*b*) certain mares, which were undoubtedly pregnant, having a very low titre of gonadotrophin in the blood during the period when it is normally high. It is believed that neither of these phenomena has been previously established as a group phenomenon.

The mares in stud farm No. 40 had shown a very low fertility in previous years. From a comparison of the systems of husbandry on the two farms and from biochemical analyses of the fodder, the authors conclude that the reproductive abnormalities encountered in stud farm No. 40 were due to a chronic deficiency of vitamins A and E in the fodder as a result of the climatic conditions of the region (Farm No. 40 being in the Omsk region, Western Siberia; Farm No. 33 being on the Krasnodar border, near the north-east coast of the Black Sea). The possibility of quantitative underfeeding being a cause of the low fertility in farm No. 40 was ruled out.

A. T. C.

* * * * *

[The Treatment of Clinical Streptococcal and Staphylococcal Infections of the Bovine Udder with Penicillin (Second Report). Murnane, D. (1946) *Austral. vet. J.* **22**. 35.]

This paper contains a further report of the work carried out by the author on the treatment of clinical mastitis with penicillin. The results obtained with different doses may be summarized as follows:—

Infection	Dosage in Units	Interval	Cases treated	Infection eliminated
Str. agalactiae	25,000 × 1 and 5,000 × 2	12 hours	14	10 (71%)
"	12,500 × 3	24 hours	28	20 (71%)
"	25,000 × 3	24 hours	41	38 (93%)
"	100,000 × 1	—	21	8 (38%)
"	25,000 × 3 (peanut oil)	24 hours	17	16 (94%)
Staphylococcus	50,000 × 4	12 hours	2	0 —
"	25,000 × 3 (peanut oil)	24 hours	6	1 (17%)

These results show that three doses of 25,000 units penicillin in aqueous solution at 24-hour intervals proved very efficient in the treatment of streptococcal mastitis and that the results were even better when an oily suspension was used. Further it is shown that the maintenance of a moderate concentration of the drug in the udder for a period of two or three days is much more effective than a relatively high concentration for a short period.

S. J. E.

Tetbury branch of the National Union of Agricultural Workers has decided to press for provision of special buildings for housing bulls, contending that the job of tending the bull is the most dangerous on the farm, and that accidents are more numerous than is generally realized.

REVIEW

[**The Book of the Pony.** Edited by R. S. Summerhays, 1946. The National Horse Association of Great Britain, London. Price 6s.]

This book is a veritable *multum in parvo*. Well compiled and excellently illustrated, its 56 pages of clear and well-spaced type and pictures contain a very stimulating essence of information. The short history of the respective breeds is fascinating and instructive.

The descriptions of the various breeds require the reader to have some technical knowledge of the points of the horse, but this in itself will impel the novice to seek explanation and thereby improve his education.

In the foreword there is a statement that "the removal of the height limit of polo ponies let into the game the small thoroughbred, and it is generally believed to its detriment." This is really a secondary result of the abolition of the off-side rule in polo, which made a call for speed and yet more speed, to the sacrifice of handiness.

Especially commendable is the paragraph on page 22 deprecating "indiscriminate and wholesale crossing of mountain pony mares with Arab, and so-called Arab, sires," etc., and using the resulting offspring for breeding back to the native stocks. The same wise counsel should be honoured in respect of other distinctive breeds, *not* excluding Shire horses. The chapter on the Connemara pony states that the first decision of the Society was that improvement should come from within.

The polo pony cannot, as yet, be regarded as a distinctive breed. As such, it is in the early stages of evolution by breeding to type. It has no "native heath," and just prior to the recent war there was an almost world-wide distribution of high-class ponies derived from a considerable variety of crosses, produced, apart from Britain and Ireland, in Argentina, the U.S.A. and Australia; but among the best there was a fair sprinkling of "polo bred" ponies, and all possible support and encouragement should be given to the development of the breed and registration in the National Pony Stud Book.

QUESTIONS IN PARLIAMENT

Living Animals (Experiments)

Mr. Peter Freeman asked the Secretary of State for the Home Department whether a licence is required where experiments on living animals are claimed to be used for veterinary purposes; whether he is aware of the unsatisfactory condition of many horses and other animals used for the preparation of sera for such conditions; whether such institutions are visited by his officers or the police; and whether he has any record of the number of such institutions.

Mr. Ede: I am advised that a licence under the Act of 1876 is required for experiments made to discover or test sera to be used for veterinary purposes, but not for procedures undertaken merely for the production of such sera. Places used solely for this purpose are neither visited by my inspectors nor registered by my Department. The police do not visit them as a matter of routine.

Mr. Freeman: Is my right hon. Friend aware that, because these institutions require no licences and are not inspected officially, appalling and often revolting conditions result, and would he take some further steps to see what can be done to protect these animals against the conditions obtaining now?

Mr. Ede: If the conditions are as my hon. Friend describes them—and I have no evidence on the point—it is open to the Royal Society for the Prevention of Cruelty to Animals, or other people who may be aware of the facts, to take the necessary proceedings.

Mr. Freeman: If I provide my right hon. Friend with particulars of specific cases will he have enquiries made in respect of these premises?

Mr. Ede: No, Sir. I have no power myself to inspect the premises. The law of the country decides the way in which they shall be dealt with.

. . . . .

Greyhounds (Prosecutions)

Mr. Peter Freeman asked the Secretary of State for the Home Department the number of cases of infringement of the Regulations governing the use of dogs in connection with dog-racing tracks which have been reported to him during 1944, 1945 and the first six months of 1946; how many of such cases were of doping dogs; and how many in connection with their general care and treatment.

Mr. Ede: In the Metropolitan police district there were two prosecutions during the period in question, one in 1944 and one in 1946, for conspiracy to defraud by administering drugs to greyhounds, but I have no complete particulars of similar proceedings elsewhere. I have not heard of any prosecutions under the Protection of Animals Acts for failure to take care of the dogs at greyhound racing tracks, but such cases would not necessarily be reported to me.

NOTES AND NEWS

Diary of Events

Dec. 7th.—Meeting of the North of Scotland Division, N.V.M.A., at Marischal College, 2 p.m.

Dec. 10th.—Scientific Meeting of the Zoological Society of London, Regent's Park, N.W.8, 5 p.m.

Dec. 11th.—N.V.M.A. Committee Meetings at 36, Gordon Square, W.C.1; Parliamentary and Public Relations Committee, 11 a.m.; Editorial Committee, 2.30 p.m.

Dec. 11th.—Mr. Harold Burrow, M.R.C.V.S., D.V.S.M., delivers the R.S.I. Benjamin Ward Richardson Memorial Lecture—"Future Control of Abattoirs and Knacker Yards"—90, Buckingham Palace Road, S.W.11, 2.30 p.m. Sir Weldon Dalrymple-Champneys, Bt., in the chair.

Dec. 12th.—Meeting of the South-Eastern Division, N.V.M.A., at Tunbridge Wells (Mount Ephraim Hotel), 2.30 p.m.

Council and Committee Meetings, N.V.M.A., in January

For the early information of members the following meetings will be held in January next:—

Jan. 9th.—General Purposes and Finance Committee (morning), Veterinary State Medicine Committee (afternoon). (Both at 36, Gordon Square.)

Jan. 10th.—Technical Development Committee at 10 a.m., Council Meeting at 11 a.m. (Both at the Connaught Rooms, Great Queen Street, Kingsway, London, W.C.2.)

July 28th—Aug. 1st.—N.V.M.A. Annual Congress in Edinburgh.

* * * * *

N.V.M.A. ANNUAL CONGRESS, 1947.

It has been decided to hold the 1947 Congress in Edinburgh from July 28th to August 1st inclusive. It is desirable that applications for accommodation should be made as early as possible as hotels and boarding-houses are already booking for next summer.

If any members fail to obtain suitable accommodation they should get in touch with the Hon. Local Secretary, Professor A. Robertson, Royal (Dick) Veterinary College, Edinburgh, 9, who will endeavour to assist them.

* * * * *

New Appointments to the Staff of the Ministry of Agriculture

As notified in recent issues, Council, N.V.M.A., has decided that no advertisements for appointments to the veterinary staff of the Animal Health Division of the Ministry of Agriculture shall be accepted for *The Veterinary Record* pending the settlement, in a manner satisfactory to the Association, of the question of the status and salaries of the Veterinary Officers of the Division.

In the meantime, any members of the profession who may, nevertheless, contemplate applying for such posts, should these be advertised elsewhere, are requested first to communicate with the General Secretary of the Association at 36, Gordon Square, London, W.C.1.

* * * * *

PERSONAL

Birth.—Pritchard.—On November 21st, 1946, at the Denbighshire Infirmary, to Margot, wife of R. W. Pritchard, M.R.C.V.S., of Denbigh—a son.

. . . . .

Birmingham Corporation Presentation to Major W. J. Brennan DeVine

On the evening of November 22nd an illuminated address express-

ing appreciation of 40 years' devoted service to Birmingham Corporation was presented to Mr. William Brennan DeVine, who retired from the position of Chief Veterinary Officer to the city on March 31st. In the absence of the Lord Mayor, the presentation was made by the Deputy Mayor, Alderman A. S. Giles, on behalf of the Salvage and Stables, Markets and Fairs and Public Health Committees, all of which were represented at the Council House gathering.

Members of the Markets and Fairs Committee also presented Mr. DeVine with a set of fish servers.

The address stated that Mr. DeVine had been "instrumental in establishing and maintaining a standard of meat and food inspection unparalleled in the United Kingdom. This fact has been of inestimable value to the general health and well-being of the vast community served by the Birmingham markets."

Alderman Giles said that Mr. DeVine's reputation had spread far beyond Birmingham.

Mr. DeVine said that when he first came to Birmingham he was given a cob and had to ride round to the various stables and dairies. Later, he was promoted and got a dog-cart, and so was able to keep his knees dry in wet weather. In 1908 he began to test cows for tuberculosis. That work in Birmingham had formed the basis of the present Government scheme for the eradication of tuberculosis.

* * * * *

R.S.I. BENJAMIN WARD RICHARDSON LECTURE

The annual Benjamin Ward Richardson Lecture of the Royal Sanitary Institute will be given this year, as sometimes in the past, by a veterinarian. On Wednesday, December 11th, at 2.30 p.m., Sir Weldon Dalrymple-Champneys, Bt., will take the chair at the Institute (90, Buckingham Palace Road, London, S.W.1) for Mr. Harold Burrow, M.R.C.V.S., D.V.S.M., who will deliver the lecture, his subject being, "Future Control of Abattoirs and Knacker Yards."

* * * * *

THE VETERINARY EDUCATIONAL TRUST

Farmers' Supporting Appeal to Milk Producers

Mr. James Turner, President of the National Farmers' Union, and Sir Thomas Baxter, Chairman of the Milk Marketing Board, have jointly signed and issued an appeal to milk producers in England and Wales to support the Veterinary Educational Trust by authorizing the Board to deduct a quarterly subscription of half a crown (or more) from their account. In its first week the Appeal raised £520 for the Trust.

. . . . . .

Eire Racing Board, Dublin, has informed the Bloodstock Industry Fund of the Veterinary Educational Trust of its willingness to subscribe 1,000 guineas to the Fund. The Racing Board adds that it is mainly concerned with research work in the matters of infertility among mares and foal mortality in thoroughbred horses.

* * * * *

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Swine Fever:

Lincs. (*Holland*).—The Avenue, Swineshead, Boston, Lincs. (Dec. 2nd); Pelham's Land, Dogdyke, Lincoln (Dec. 2nd).

Lincs. (*Kesteven*).—High Street, Billinghay, Lincoln (Nov. 29th).

Lincs. (*Lindsey*).—Church Drive Allotments, Boultham Park Road, Lincoln (Nov. 29th).

Northants.—High Street, Bugbrooke, Northampton (Nov. 29th).

Sheep Scab:

Flintshire.—Waen Helyn, Rhualtt, St. Asaph, Flintshire (Nov. 28th).

* * * * *

DUBLIN OFFICE OF BURROUGHS WELLCOME & CO.

The opening of the Dublin Office of Burroughs Wellcome & Co., at 18, Merrion Square was celebrated on November 12th, 1946, by a dinner at the Royal Hibernian Hotel, Dublin, which was attended by the Lord Mayor, Ald. J. McCann, T.D., and by leading members of the medical, dental, veterinary and pharmaceutical professions.

The dinner was presided over by Mr. Leslie G. Matthews (Distribution Director, The Wellcome Foundation Ltd.), who, in proposing the toast "Our Guests," outlined the purpose of the Dublin Office, by which it was intended to place the scientific and technical resources of The Wellcome Foundation Ltd., more readily at the disposal of the Company's many friends and customers in Ireland and to establish closer communication between them and the London Office.

Extending a special welcome to Mr. John A. Flynn (President of the Irish Veterinary Medical Association), Mr. Matthews mentioned the wide and growing scientific interests of the Foundation and discussed the increased scope for the study of animal diseases made possible by the recent establishment of The Wellcome Veterinary Research Station in Sussex, at which the problems of veterinary medicine and animal husbandry are investigated under field conditions. He referred also to The Foundation's practical interest in veterinary education and recalled some of its recent scientific achievements, in particular the part played in the maintenance of supplies of sera, vaccines and penicillin.

In supporting the toast, Dr. H. J. Parish (Clinical Research Director, The Wellcome Foundation Ltd.) extended a warm welcome to his medical colleagues, who included Professor J. W. Bigger (Dean of the Faculty of Physic, Dublin University), Professor J. M. O'Connor (Dean of the Faculty of Medicine, National University of Ireland), Dr. Bethel Solomons (President of the Royal College of Physicians of Ireland), Dr. Andrew Ryans (President of the Irish Medical Association) and Dr. J. Deeny (Chief Medical Adviser, Department of Local Government and Public Health of Eire). Dr. Parish continued with an interesting survey of the many outstanding figures in Irish medical history, and referred to the many Scientific Institutions in The Wellcome Foundation.

In reply the Lord Mayor expressed his admiration of the philanthropic purpose of Sir Henry Wellcome's bequest and its practical fulfilment through the work of The Foundation and hoped that its humanitarian endeavours might help to solve some of Dublin's own particular public health problems.

Professor Bigger enlarged on the unique constitution of The Wellcome Foundation as an organization devoted to the furtherance of research and discussed its distinguished record of scientific achievement. He joined in extending a warm welcome to the Company's Dublin Office which, he felt, would strengthen the long and intimate connection of Burroughs Wellcome & Co. with Ireland. Professor O'Connor referred to the wealth of enterprise indicated by the many activities of the The Foundation and to the effective co-ordination of medical, dental, pharmaceutical and veterinary interests in its work.

The evening concluded with a musical entertainment provided by "The Antlers," compèred by the well-known Dublin humorist, Mr. Paddy Henry and interspersed with sets of Irish dances, provided by the Comerford Troop.

* * * * *

As noted in our columns at the time, last February over three thousand dairy farmers, agriculturists and representatives of the dairy industry gathered at a three-day conference in Winchester, organized by the Hampshire War Agricultural Executive Committee, to discuss the mechanization of milk production. A verbatim report of the papers read and an account of the keen discussions which followed is now available in a new publication issued by the Ministry of Agriculture ("The Mechanization of Milk Production." H.M. Stationery Office, price 2s., 2s. 2d. by post).

* * * * *

Dr. R. du Toit, of the Onderstepoort laboratories, states that, although the measures being taken to stamp out the cattle disease of 'ngana in Zululand, where nine aircraft are being used to spread D.D.T. smoke over 40 square miles of fly-infested territory, are not due to end for six weeks, almost all the tsetse flies have been eliminated.—*The Times.*

* * * * *

H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office.

	Price net s. d.	*Post free* s. d.
Public General Acts (9 and 10 Geo. 6) (Session 1945-46):		
Ch. 73. Hill Farming	0 6	0 7
Agriculture and Fisheries, Ministry of:		
Mechanization of Milk Production. Report of a Conference in the Guildhall, Winchester. February 5th, 6th and 7th, 1946	2 0	2 2
Growmore Bulletin No. 5. Emergency Poultry Feeding ... ... Each	0 3	0 4
50 Copies	10 0	10 6